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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,697	02/03/2006	Masaru Nagamine	YMUCP009	3883

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Weaver Austin Villeneuve & Sampson LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER

BERDICHEVSKY, MIRIAM

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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10/08/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@wavsip.com

Office Action Summary	Application No. 10/567,697	Applicant(s) NAGAMINE, MASARU	
	Examiner MIRIAM BERDICHEVSKY	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Roidt (US 6127766).

As to claim 1, Roidt teaches a paired tube thermoelectric (TE) couple comprising an n-type member which includes a conductive tubular member having a channel in it (figure 3: 65 is shown as a hollow cylinder which reads on tube) and an n-type semiconductor layer formed on the outside of the conductive tubular member (30); a p-type member which includes a conductive tubular member having a channel 70 in it (figure 3: 65 is shown as a hollow cylinder which reads on tube) and a p-type semiconductor layer formed on the outside of the conductive tubular member (20); and a connector which electrically connects the conductive tubular members (66, 68) (figure 3) (col. 4, lines 45-51 and col. 5, lines 34-37).

Regarding claim 2, Roidt teaches that the tubular members are connected in series, the n-type and p-type layers of each TE element being connected to the p-type and n-type of another TE element, respectively (figure 3, col. 2, lines 50-55).

As to claim 3, Roidt teaches a paired tube thermoelectric (TE) couple comprising an n-type member which includes a conductive tubular member having a channel in it

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(65) and an n-type semiconductor layer formed on the outside of the conductive tubular member (30); a p-type member which includes a conductive tubular member having a channel in it (65) and a p-type semiconductor layer formed on the outside of the conductive tubular member (20); and a connector which electrically connects the n-type and p-type layers (66, 68) (figure 3) (col. 4, lines 45-51 and col. 5, lines 34-37).

Regarding claim 4, Roidt teaches that the tubular members are connected in series, the n-type and p-type layers of each TE element being connected to the p-type conductive tubular member and n-type conductive tubular member of another TE element, respectively (figure 3; col. 2, lines 50-55).

Regarding claim 5, Roidt teaches that a conductive layer formed on each of the n-type and p-type layers (66, figure 3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roidt and Anders (US 3159979).

As to claim 6, Roidt teaches a paired tube thermoelectric (TE) couple comprising an n-type member which includes a conductive tubular member having a channel in it (65) and an n-type semiconductor layer formed on the outside of the conductive tubular member (30); a p-type member which includes a conductive tubular member having a channel in it (65) and a p-type semiconductor layer formed on the outside of the conductive tubular member (20); and a connector which electrically connects the conductive tubular members (66, 68) (figure 3) (col. 4, lines 45-51 and col. 5, lines 34-37).

Roidt is silent to the n-type layer being on one half of the outer surface of the conductive tubular member when the outer surface is divided into two along the longitudinal center axis.

Anders teaches TE tubular elements wherein the n-type layer being on one half of the outer surface of the conductive tubular member when the outer surface is divided into two along the longitudinal center axis (figures 4, 5 and 10; col. 3, line 65 to col. 4, line 20 and col.5, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the divided tubes of Anders in Roidt because placing both layers on one tube standardizes the manufacturing process (i.e. one tube is made instead of two different tubes).

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Regarding claim 7, Roidt teaches that the tubular members are connected in series, the n-type and p-type layers of each TE element being connected to the p-type and n-type of another TE element, respectively (figure 3, col. 2, lines 50-55).

6. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roidt and Nolas (Thermoelectric Basic Principles and New Materials Developments).

As to claim 8, Roidt teaches a forming a pair of tube thermoelectric (TE) couples comprising an n-type member which includes a conductive tubular member having a channel in it (65) and an n-type semiconductor layer formed on the outside of the conductive tubular member (30); a p-type member which includes a conductive tubular member having a channel in it (65) and a p-type semiconductor layer formed on the outside of the conductive tubular member (20); and a connector which electrically connects the conductive tubular members (66, 68) (figure 3) (col. 4, lines 45-51 and col. 5, lines 34-37). Roidt teaches that the n-type and p-type alloys are bismuth telluride (col.4, lines 55-60).

Roidt is silent to sintering the n-type and p-type bodies.

Nolas teaches that sintering thermoelectric materials such as bismuth telluride are robust and do not require the same precautions to establish homogeneity (page 159).

It would have been obvious to one of ordinary skill in the art at the time of the invention to sinter the alloys of Roidt because sintering creates a robust alloy, as taught by Nolas (page 159).

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Regarding claim 9, modified Roidt is silent to forming the conductor layer on the n-type and p-type members before connecting the n-type and p-type members in series.

It would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the order of contact layer formation and series connection because the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results (MPEP 2144.04).

7. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roidt and Nolas as applied to claim 8 above and further in view of Katz (US 3285786).

Regarding claims 10-11, modified Roidt teaches that the semiconductor material may be extruded on the tubes in some form of high temperature extrusion process (col. 4, lines 60-65) but is silent to the fluid conductive tubular member and fluid semiconductor being extruded simultaneously from a single die.

Katz teaches the coextrusion of thermoelectric elements wherein the materials are cast (fluid), thermoelectric and conductive metal are extruded (col. 3, lines 25-30 and col. 4, lines 5-20 and col. 6, lines 20-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coextrusion technique of Katz in modified Roidt because the coextrusion forms an electrical contact extremely well bonded to the highly consolidated thermoelectric body for optimum use, as taught by Katz (col. 1, lines 35-45).

Contact Information

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MIRIAM BERDICHEVSKY** whose telephone number is (571)270-5256. The examiner can normally be reached on M-Th, 10am-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Michener can be reached on (571) 272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1795